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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/688,254	LIGHTSTONE ET AL.	
	Examiner	Art Unit	
	Andy S. Rao	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/14/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's arguments with respect to amended claims 1-9 and 30-32 (Amendment of 7/14/08: page 9, lines 14-28; page 10, lines 1-29; page 11, lines 1-29; page 12, lines 1-7) have been considered but are moot in view of the new ground(s) of rejection. A detailed rejection addressing the newly added "switch back..." limitations appears below.

2. Applicant's arguments filed with respect to claims 10-29 as filed on 7/14/08 have been fully considered but they are not persuasive.

3. Claims 27-29 (amended) remain rejected under 35 U.S.C. 102(e) as being anticipated by Ribas-Corbera.

4. Claims 10-26 (amended) remains rejected under 35 U.S.C. 103(a) as being unpatentable over Ribas-Corbera in view of Tan et al. (hereinafter referred to as "Tan").

5. The Applicant presents two arguments for the Examiner's consideration, one contending the Examiner's previously pending rejection of claims 27-29 under 35 U.S.C. 102(e) as being anticipated by Ribas-Corbera, as was set forth in the Office Action of 3/13/08, said argument being presented in support of the currently amended claims 27-29 now positively reciting the "...according to a time constant set to be larger than a scene..." limitation with the argument directed thereto, and another argument contending the Examiner's previously pending rejection of claims 10-26 under 35 U.S.C. 103(a) as being unpatentable over Ribas-Corbera in view of Tan et al. (hereinafter referred to as "Tan"), as was set forth in the Office Action of 3/13/08, said argument being presented in support of the currently amended claims 10-26 now positively reciting the "...each macroblock type having distinct rate-quantization properties..." limitation

with the argument directed thereto. However, after a careful consideration of the arguments presented and further scrutiny the applied references, the Examiner must respectfully disagree and maintain the applicability of the references as the basis of the rejections addressing the newly presented limitations for the following reasons.

After summarizing the salient features of the amended claim and explaining the pertinent section of the Specification that supports the added limitation (Amendment of 7/14/08: page 8, lines 11-26; page 1-3), the Applicant argue that Ribas-Corbera fails to address the "...time constant..." limitation as in the claims (Amendment of 7/14/08: page 9, lines 4-15). The Examiner respectfully disagrees. It is noted that the reference discloses the use of a speed convergence factor (Ribas-Corbera: column 6, lines 1-5: 120 GOPs which is e. an interval that is defined by the reference to be larger than a scene) which is used to track changes and adjust the average bit rate by feedback control (Ribas-Corbera: column 9, lines 10-30). Accordingly, the Examiner maintains that the limitation remains met.

Lastly, after reviewing the Examiner's combination of the primary Ribas-Corbera reference with the secondary Tan teaching (Amendment of 7/14/08: page 12, lines 8-17), highlighting the salient features of the amended claims (Amendment of 7/14/08: page 12, lines 18-28; page 13, lines 1-3), the Applicant argue that the references fail to address the "...distinct rate quantization properties on a macroblock basis..." limitation (Amendment of 7/14/08: page 13, lines 5-25), as in the claims. The Examiner flatly disagrees. Tan discloses that the generated macroblock type signal is summarily derived from specific rate quantization bounds (Tan: column 11, lines 5-20). Accordingly, the Examiner maintains that the limitation remains met.

Detailed rejections appear below.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 27-29 (amended) remain rejected under 35 U.S.C. 102(e) as being anticipated by Ribas-Corbera.

Ribas-Corbera discloses a method (Ribas-Corbera: figure 6) of variable bit rate control in a video compression encoder (Ribas-Corbera: figure 5) having a variable bit rate controller (Ribas-Corbera: column 11, lines 45-52) with a peak bit rate (Ribas-Corbera: column 7, lines 15-20) and a selectable average bit rate (Ribas-Corbera: column 9, lines 15-20), comprising:

measuring changes in long-term average bit rate of an output bitstream of said encoder (Ribas-Corbera: column 7, lines 49-52); and adjusting said average bit rate of said variable bit rate controller to track said changes in long-term (Ribas-Corbera: column 6, lines 1-5; column 9, lines 10-25) average bit rate (Ribas-Corbera: column 7, lines 55-65) by feedback control based on a difference between said average bit rate and an actual bit rate (Ribas-Corbera: column 7, lines 45-50) and according to a time constant set to be larger than a scene (Ribas-Corbera: column 6, lines 1-5: 120 GOPs which is e. an interval that is defined by the reference to be larger than a scene), as in claim 27.

Regarding claim 28, Ribas-Corbera discloses wherein said adjusting comprises: adapting to said changes in long-term average bit rate according to a time constant (Ribas-Corbera: column 10, lines 50-60) is set to be larger than the longest scene of any given complexity in the bitstream (Ribas-Corbera: column 9, lines 10-25), as in the claim.

Regarding claim 29, Ribas-Corbera discloses wherein said adjusting comprises: adapting to said changes in long-term average bit rate according to a proportional integral controller response (Ribas-Corbera: column 12, lines 55-67), as in the claim.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-6 and 30-32 (amended) are rejected under 35 U.S.C. 103(a) as being unpatentable over Ribas-Corbera in view of Hanamura et al., (hereinafter referred to as "Hanamura"), and further in view of Oishi et al., (hereinafter referred to as "Oishi").

Ribas-Corbera discloses a rate controller for a block-based video encoder (Ribas-Corbera: figure 5), comprising: a variable bit rate (VBR) controller generating a first quantization step size for a current picture (Ribas-Corbera: column 11, lines 45-52); a constant bit rate (CBR) controller generating a second quantization step size (Ribas-Corbera: column 11, lines 1-10); and a selector configured to select a maximum permissible quantization step size from said first quantization step size and said second quantization step size for use by a quantizer in quantizing transform data associated with the current picture (Ribas-Corbera: column 8, lines 25-45), as in claim 1. However, Ribas-Corbera fails to disclose that the VBR controller and CBR controller are operating in tandem and independently from each other and a selector configured to switch back and forth between the VBR controller and the CBR controller, as in the claim. Hanamura the use of video transcoders (Hanamura: figure 1) which disclose a VBR coder (Hanamura: column 13, lines 50-55) and a CBR coder (Hanamura: column 14, lines 25-35) that operate independently but in tandem with each other (Hanamura: column 3, lines 3-7) in order to for coding flexibility on constrained bitstreams (Hanamura: column 3, lines 8-15). Accordingly, given this teaching, it would have obvious for one of ordinary skill in the art at the time of the invention to incorporate teaching of Hanamura's separate VBR/CBR coders into the Ribas-Corbera rate controller in order to allow for coding flexibility on constrained bitstreams. The Examiner further notes that even without the secondary Hanamura teaching, the feature of having the VBR and CBR coders operating in tandem but independently of each other as in the

claims represents nothing more than separating that which was once integral, a modification which the courts have long established as unpatentable and well within the purview of one of ordinary skill in the art, *Nerwin v. Erlichman, 168 USPQ 177, 179 (PTO Bd. of Int. 1969).* The Ribas-Corbera rate controller now modified to implement separate VBR/CBR coders as shown by Hanamura and further discussed with regards to established case law, has a majority of the features of the claim, and but still fails to disclose a selector configured to switch back and forth between the VBR controller and the CBR controller. Oishi discloses a video coding apparatus which discloses a dual VBR/CBR encoding method and includes the use of a switch between the controllers (Oishi: column 10, lines 1-60) in order to allow the multiplexing of both CBR and VBR data (Oishi: column 5, lines 35-50). Accordingly, given this teaching, it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate Oishi's VBR/CBR switcher into the Ribas-Corbera rate controller in order to have the Ribas-Corbera rate controller have the capability to multiplex variable bit rate coded data with constant bit rate coded data into one output stream. The Ribas-Corbera rate controller, now modified to implement separate VBR/CBR coders as shown by Hanamura and further discussed with regards to established case law and also incorporating the Oishi VBR/CBR switcher, has all of the features of claim 1.

Regarding claim 2, the Ribas-Corbera rate controller now modified to implement separate VBR/CBR coders as shown by Hanamura and further discussed with regards to established case law, discloses an input for processing at least one parameter of operation for at least one of said VBR controller and said CBR controller (Ribas-Corbera: column 4, lines 35-40), as in the claim.

Regarding claim 3, the Ribas-Corbera rate controller now modified to implement separate VBR/CBR coders as shown by Hanamura and further discussed with regards to established case law, discloses wherein said at least one parameter includes at least one of a target peak bit rate (Ribas-Corbera: column 7, lines 15-20), a target average bit rate (Ribas-Corbera: column 7, lines 10-11), a maximum quantization scale (Ribas-Corbera: column 7, lines 30-35), a minimum quantization scale (Ribas-Corbera: column 7, lines 50-60), a target quantizer scale, a target buffer scale, a VBV buffer size, and a time constant for said VBR rate controller to track changes in long-term average bit rate (Ribas-Corbera: column 6, lines 1-10), as in claim 3.

Regarding claims 4-6, the Ribas-Corbera rate controller now modified to implement separate VBR/CBR coders as shown by Hanamura and further discussed with regards to established case law, discloses wherein an average bit rate of said VBR controller tracks variations in long-term (Ribas-Corbera: column 6, lines 1-5; column 9, lines 15-25) average bit rate of an output bit stream of said video compression encoder (Ribas-Corbera: column 7, lines 49-53), as in the claims.

Ribas-Corbera discloses a method of rate control (Ribas-Corbera: figure 6) in a video compression encoder (Ribas-Corbera: figure 5), comprising: generating a first quantization step size using a constant bit rate encoder for a current picture (Ribas-Corbera: column 11, lines 1-10); forming a second quantization step size using a variable bit rate encoder (Ribas-Corbera: column 11, lines 45-53); and selecting a maximum quantization step size (Ribas-Corbera: column 9, lines 25-35) from said first quantization step size and said second quantization step size (Ribas-Corbera: column 9, lines 25-35) for use in quantizing compressed video data (Ribas-Corbera: column 8, lines 25-45), as in claim 30. However, Ribas-Corbera fails to disclose that

the VBR encoder and CBR encoder are operating in tandem and independently from each other and switching back and forth between the constant bit rate encoder and the variable bit rate encoder, as in the claim. Hanamura the use of video transcoders (Hanamura: figure 1) which disclose a VBR coder (Hanamura: column 13, lines 50-55) and a CBR coder (Hanamura: column 14, lines 25-35) that operate independently but in tandem with each other (Hanamura: column 3, lines 3-7) in order to for coding flexibility on constrained bitstreams (Hanamura: column 3, lines 8-15). Accordingly, given this teaching, it would have obvious for one of ordinary skill in the art at the time of the invention to incorporate teaching of Hanamura's separate VBR/CBR coders into the Ribas-Corbera rate controlling method in order to allow for coding flexibility on constrained bitstreams. The Examiner further notes that even without the secondary Hanamura teaching, the feature of having the VBR and CBR coders operating in tandem but independently of each other as in the claims represents nothing more than separating that which was once integral, a modification which the courts have long established as unpatentable and well within the purview of one of ordinary skill in the art, *Nerwin v. Erlichman, 168 USPQ 177, 179 (PTO Bd. of Int. 1969).* The Ribas-Corbera rate controlling method now modified to implement separate VBR/CBR coders as shown by Hanamura and further discussed with regards to established case law, has a majority of the features of the claim, but still fails to disclose switching back and forth between the VBR controller and the CBR controller. Oishi discloses a video coding apparatus which discloses a dual VBR/CBR encoding method and includes the use of a switch between the controllers (Oishi: column 10, lines 1-60) in order to allow the multiplexing of both CBR and VBR data (Oishi: column 5, lines 35-50). Accordingly, given this teaching, it would have been obvious to one of ordinary skill in the art at the time of invention to

incorporate Oishi's VBR/CBR switching step into the Ribas-Corbera-Hanamura rate controlling method in order to have the Ribas-Corbera-Hanamura rate controlling method have the capability to multiplex variable bit rate coded data with constant bit rate coded data into one output stream. The Ribas-Corbera rate controlling method, now implementing separate VBR/CBR coders as shown by Hanamura and also discussed with regards to established case law and also incorporating the Oishi VBR/CBR switching step, has all of the features of claim 30.

Regarding claims 31-32, the Ribas-Corbera rate controlling method, now implementing separate VBR/CBR coders as shown by Hanamura and also discussed with regards to established case law and also incorporating the Oishi VBR/CBR switching step, has wherein said forming comprises: tracking long-term average bit rates (Ribas-Corbera: column 7, lines 55-65) using a proportional integral encoder (Ribas-Corbera: column 12, lines 55-67), as in the claims.

10. Claims 10-26 (amended) remain rejected under 35 U.S.C. 103(a) as being unpatentable over Ribas-Corbera in view of Tan et al. (hereinafter referred to as "Tan").

Ribas-Corbera discloses a constant bit rate controller for a video compression encoder (Ribas-Corbera: figure 5; column 11, lines 1-10), comprising: a picture analysis module (Ribas-Corbera: column 4, lines 40-50); a complexity model module coupled (Ribas-Corbera: column 5, lines 8-13) to said picture analysis module configured to form a predicted picture complexity estimate based on a statistical frequency within said current picture (Ribas-Corbera: column 9, lines 20-25); a bit allocation module adapted to form a bit allocation consistent with said predicted picture complexity estimate (Ribas-Corbera: column 5, lines 45-55); and a picture-level quantizer assignment module adapted to assign a quantization step size consistent with said

bit allocation (Ribas-Corbera: column 6, lines 20-35), as in claim 10. However, Ribas-Corbera fails to disclose "…a picture analysis module configured to classify macroblocks within a current picture by type, each macroblock type having distinct rate quantization properties, determine a statistical frequency of each of at least two different types of macroblocks within the current picture and for forming at least one statistical indicator of the complexity of each of said at least two different types of macroblocks based on quantization-dependent bits in the each of said at least two different types of macroblocks…" as in the claims. Tan discloses a video decoder method and apparatus which discloses the use of picture analysis module comprising a video complexity verifier (Tan: column 7, lines 40-67; column 8, lines 1-10) which classifies macroblocks within a current picture by type, each macroblock type having distinct rate quantization properties (Tan: column 11, lines 5-20: rate and quantization properties are used to generate the 'macroblock' type signal), determine a statistical frequency of each of at least two different types of macroblocks (Tan: column 14, lines 40-50) within the current picture and for forming at least one statistical indicator of the complexity of each of said at least two different types of macroblocks based on quantization-dependent bits in the each of said at least two different types of macroblocks (Tan: column 9, lines 15-65) in order to ensure that VBV model constraints are met (Tan: column 15, lines 43-57). Accordingly, given this teaching, it would have obvious to incorporate the Tan macroblock operative picture analysis module into the Ribas-Corbera rate controller in order ensure that Ribas-Corbera video coder adheres to VBV model constraints. The Ribas-Corbera video coder, now incorporating the Tan macroblock operative picture analysis module, has all of the features of claims 10.

Regarding claim 11, the Ribas-Corbera video coder, now incorporating the Tan macroblock operative picture analysis module, discloses wherein said bit allocation module comprises: an ideal bit allocation module configured to calculate an ideal bit allocation based on an estimated complexity of a picture (Ribas-Corbera: column 4, lines 35-40); a video bitstream verification (VBV) fullness adjustment module configured to adjust said ideal bit allocation to maintain a desired VBV buffer fullness range (Ribas-Corbera: column 12, lines 5-20); and a VBV compliance adjustment module configured to adjust said ideal bit allocation to maintain VBV compliance (Ribas-Corbera: column 6, lines 5-10), as in the claim.

Regarding claims 12-13, the Ribas-Corbera video coder, now incorporating the Tan macroblock operative picture analysis module, discloses wherein said indicator of complexity comprises an energy value for each macroblock type (Ribas-Corbera: column 1, lines 45-55), as in the claims.

Regarding claims 14-15, the Ribas-Corbera video coder, now incorporating the Tan macroblock operative picture analysis module, discloses wherein said complexity model module (Ribas-Corbera: column 5, lines 8-12) generates a measurement of the complexity of each type of macroblock (Tan: column 14, lines 40-50) and a running estimate of macroblock type complexities (Ribas-Corbera: column 9, lines 25-35), as in the claims.

Ribas-Corbera discloses a method of constant bit rate (CBR) rate control in a video compression encoder (Ribas-Corbera: figure 6), comprising: for a current picture (Ribas-Corbera: column 9, lines 15-20: current picture contained in "current GOP"), determining a statistical frequency (Ribas-Corbera: column 4, lines 35-40); generating a statistical indicator indicative of a complexity (Ribas-Corbera: column 5, liens 20-25); predicting picture complexity

to form a predicted picture complexity by forming a weighted sum (Ribas-Corbera: column 9, lines 20-25), wherein each picture type has a weight that increases with its statistical frequency and with a value of said statistical indicator (Ribas-Corbera: column 4, lines 50-55); and generating a bit allocation consistent with said predicted picture complexity (Ribas-Corbera: column 5, lines 50-55); and type of assigning a quantizer step size consistent with said bit allocation (Ribas-Corbera: column 6, lines 20-43), as in the claim. However, Ribas-Corbera fails to disclose "...for a current picture, classifying macroblocks within a current picture by type, each macroblock type having distinct rate quantization properties, determine a statistical frequency of each of at least two different types of macroblocks within the current picture and for forming at least one statistical indicator of the complexity of each of said at least two different types of macroblocks based on quantization-dependent bits in the each of said at least two different types of macroblocks..." as in the claims. Tan discloses a video decoder method and apparatus which discloses the use of picture analysis module comprising a video complexity verifier (Tan: column 7, lines 40-67; column 8, lines 1-10) which classifies macroblocks within a current picture by type, each macroblock type having distinct rate quantization properties (Tan: column 11, lines 5-20: rate and quantization properties are used to generate the 'macroblock' type signal), determine a statistical frequency of each of at least two different types of macroblocks (Tan: column 14, lines 40-50) within the current picture and for forming at least one statistical indicator of the complexity of each of said at least two different types of macroblocks based on quantization-dependent bits in the each of said at least two different types of macroblocks (Tan: column 9, lines 15-65) in order to ensure that VBV model constraints are met (Tan: column 15, lines 43-57). Accordingly, given this teaching, it would have obvious to incorporate the Tan

macroblock operative picture analysis step into the Ribas-Corbera rate controlling method in order ensure that Ribas-Corbera video coder adheres to VBV model constraints. The Ribas-Corbera video coding method, now incorporating the Tan macroblock operative picture analysis step, has all of the features of claims 16.

Regarding claims 17-20, the Ribas-Corbera video coding method, now incorporating the Tan macroblock operative picture analysis step, discloses generating a measurement of the complexity of each type of macroblock (Tan: column 14, lines 40-50), as in the claims.

Regarding claims 21-22, Ribas-Corbera discloses generating a running estimate of macroblock type complexities (Ribas-Corbera: column 9, lines 15-25), as in the claims.

Regarding claim 23, Ribas-Corbera discloses wherein said values of said previous picture are weighted (Ribas-Corbera: column 4, lines 50-54) by an aging factor (Ribas-Corbera: column 4, lines 60-65), as in the claim.

Regarding claims 24-26, Ribas-Corbera discloses generating an intra energy output for bit prediction in a video bitstream compliance check (Ribas-Corbera: column 11, lines 50-65), as in the claims.

11. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ribas-Corbera in view of Hanamura et al., (hereinafter referred to as "Hanamura") and Oishi et al., (hereinafter referred to as "Oishi") applied to claim 1 above, and further in view of Tan et al., (hereinafter referred to "Tan").

Regarding claim 7, the Ribas-Corbera rate controller, now to implement separate VBR/CBR coders as shown by Hanamura and further discussed with regards to established case law and also incorporating the Oishi VBR/CBR switcher, has a majority of the features of the

claim as has been discussed above concerning claim 1, and further includes a picture analysis module (Ribas-Corbera: column 4, lines 40-50); a complexity model module coupled (Ribas-Corbera: column 5, lines 8-13) to said picture analysis module configured to form a predicted picture complexity estimate based on a statistical frequency within said current picture (Ribas-Corbera: column 9, lines 20-25); a bit allocation module adapted to form a bit allocation consistent with said predicted picture complexity estimate (Ribas-Corbera: column 5, lines 45-55); and a picture-level quantizer assignment module adapted to assign a quantization step size consistent with said bit allocation (Ribas-Corbera: column 6, lines 20-35), as specified. However, Ribas-Corbera-Hanamura-Oishi combination fails to "…a picture analysis module configured to classify macroblocks within a current picture by determine a statistical frequency of each of at least two different types of macroblocks within the current picture and for forming at least one statistical indicator of the complexity of each of said at least two different types of macroblocks based on quantization-dependent bits in the each of said at least two different types of macroblocks…" as in the claims. Tan discloses a video decoder method and apparatus which discloses the use of picture analysis module comprising a video complexity verifier (Tan: column 7, lines 40-67; column 8, lines 1-10) which classifies macroblocks within a current picture by determine a statistical frequency of each of at least two different types of macroblocks (Tan: column 14, lines 40-50) within the current picture and for forming at least one statistical indicator of the complexity of each of said at least two different types of macroblocks based on quantization-dependent bits in the each of said at least two different types of macroblocks (Tan: column 9, lines 15-65) in order to ensure that VBV model constraints are met (Tan: column 15, lines 43-57). Accordingly, given this teaching, it would have obvious to incorporate the Tan

macroblock operative picture analysis module into the Ribas-Corbera-Hanamura combination in order ensure that Ribas-Corbera video coder adheres to VBV model constraints. The Ribas-Corbera rate controller, now modified to implement separate VBR/CBR coders as shown by Hanamura and further discussed with regards to established case law and incorporating the Oishi VBR/CBR switcher and the Tan macroblock operative picture analysis module, has all of the features of claim 7.

Regarding claim 8, the Ribas-Corbera rate controller, now modified to implement separate VBR/CBR coders as shown by Hanamura and further discussed with regards to established case law and incorporating the Oishi VBR/CBR switcher and the Tan macroblock operative picture analysis module, has wherein said indicator of complexity comprises an energy value calculated from an activity measurement (Ribas-Corbera: column 1, lines 45-55), of macroblocks (Tan: column 14, lines 40-50), as in the claim.

Regarding claim 9, the Ribas-Corbera rate controller, now modified to implement separate VBR/CBR coders as shown by Hanamura and further discussed with regards to established case law and incorporating the Oishi VBR/CBR switcher and the Tan macroblock operative picture analysis module, has wherein said bit allocation module comprises: an ideal bit allocation module configured to calculate an ideal bit allocation based on an estimated complexity of a picture (Ribas-Corbera: column 4, lines 35-40); a video bitstream verification (VBV) fullness adjustment module configured to adjust said ideal bit allocation to maintain a desired VBV buffer fullness range (Ribas-Corbera: column 12, lines 5-20); and a VBV compliance adjustment module configured to adjust said ideal bit allocation to maintain VBV compliance (Ribas-Corbera: column 6, lines 5-10), as in the claim.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Azedegan discloses a video encoding method and system which encodes using a rate-quantizer model. Tabatabai discloses a bit rate control mechanism for digital image and video data compression. Uz discloses adaptive quantization.

13. Applicant's amendment to claims 1-9 and 30-32 necessitated the new ground(s) of rejection presented in this Office action against those claims. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andy S. Rao whose telephone number is (571)-272-7337. The examiner can normally be reached on Monday-Friday 8 hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571)-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Primary Examiner
Art Unit 2621

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Primary Examiner, Art Unit 2621
September 23, 2008